

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

**Listing of Claims:**

Claim 1 (original): A composition comprising a MTB39 antigen (SEQ ID NO:12 or 14) or an immunogenic fragment thereof from a *Mycobacterium* species of the tuberculosis complex, and a MTB32A antigen (SEQ ID NO:2 or 4) or an immunogenic fragment thereof from a *Mycobacterium* species of the tuberculosis complex.

Claim 2 (original): The composition of claim 1, comprising a MTB39 antigen (SEQ ID NO:12 or 14) or an immunogenic fragment thereof from a *Mycobacterium* species of the tuberculosis complex, and a polypeptide comprising at least 195 amino acids from the N-terminus of a MTB32A antigen (SEQ ID NO:2 or 4) from a *Mycobacterium* species of the tuberculosis complex.

Claim 3 (original): The composition of claim 2, further comprising a polypeptide comprising at least about 132 amino acids from the C-terminus of MTB32A antigen (SEQ ID NO:2 or 4) from a *Mycobacterium* species of the tuberculosis complex.

Claim 4 (original): The composition of claims 1, 2, or 3, wherein the antigens are covalently linked, thereby forming a fusion polypeptide.

Claim 5 (original): The composition of claim 4, wherein the fusion polypeptide has the amino acid sequence of MTB59F (SEQ ID NO:20).

Claim 6 (original): The composition of claim 4, wherein the fusion polypeptide has the amino acid sequence of MTB72F (SEQ ID NO:16).

Claim 7 (original): The composition of claim 4, wherein the fusion polypeptide has the amino acid sequence of MTB72FMutSA (SEQ ID NO:18).

Claim 8 (original): The composition of claim 6 or 7, further comprising BCG.

Claim 9 (original): The composition of claim 6 or 7, further comprising at least one additional antigen from a *Mycobacterium* species of the tuberculosis complex, wherein the antigen is selected from the group consisting of MTB8.4 antigen (SEQ ID NO:22), MTB9.8 antigen (SEQ ID NO:24), MTB9.9 antigen (SEQ ID NO:27), MTB40 antigen (SEQ ID NO:29), MTB41 antigen (SEQ ID NO:31), 38-1 (SEQ ID NO:35), TbRa3 (SEQ ID NO:37), 38 kD (SEQ ID NO:39), DPEP (SEQ ID NO:41), TbH4 (SEQ ID NO:43), DPPD (SEQ ID NO:45), MTB82, Erd14, ESAT-6 antigen (SEQ ID NO:33), MTB85 complex antigen, or  $\alpha$ -crystalline antigen, or an immunogenic fragment thereof.

Claim 10 (original): The composition of claim 6 or 7, further comprising an adjuvant.

Claim 11 (original): The composition of claim 4, wherein the antigens are covalently linked via a chemical linker.

Claim 12 (original): The composition of claim 11, wherein the chemical linker is an amino acid linker.

Claim 13 (original): The composition of claim 1, further comprising at least one additional antigen from a *Mycobacterium* species of the tuberculosis complex, wherein the antigen is selected from the group consisting of MTB8.4 antigen (SEQ ID NO:22), MTB9.8 antigen (SEQ ID NO:24), MTB9.9 antigen (SEQ ID NO:27), MTB40 antigen (SEQ ID NO:29), MTB41 antigen (SEQ ID NO:31), 38-1 (SEQ ID NO:35), TbRa3 (SEQ ID NO:37), 38 kD (SEQ ID NO:39), DPEP (SEQ ID NO:41), TbH4 (SEQ ID NO:43), DPPD (SEQ ID NO:45), MTB82,

Erd14, ESAT-6 antigen (SEQ ID NO:33), MTB85 complex antigen, or  $\alpha$ -crystalline antigen, or an immunogenic fragment thereof.

Claim 14 (original): The composition of claim 1, further comprising an adjuvant.

Claim 15 (original): The composition of claim 14, wherein the adjuvant comprises QS21 and MPL.

Claim 16 (original): The composition of claim 14, wherein the adjuvant is selected from the group consisting of AS2, ENHANZYN, MPL, 3D-MPL, IFA, QS21, CWS, TDM, AGP, CPG, Leif, saponin, and saponin mimetics.

Claim 17 (original): The composition of claim 1, further comprising BCG or pVac.

Claim 18 (original): The composition of claim 1, further comprising an NS1 antigen or an immunogenic fragment thereof.

Claim 19 (original): The composition of claim 1, wherein the *Mycobacterium* species is *Mycobacterium tuberculosis*.

Claim 20 (original): An expression cassette comprising a nucleic acid encoding a MTB39 antigen (SEQ ID NO:12 or 14) or an immunogenic fragment thereof from a *Mycobacterium* species of the tuberculosis complex, and a nucleic acid encoding a MTB32A antigen (SEQ ID NO:2 or 4) or an immunogenic fragment thereof from a *Mycobacterium* species of the tuberculosis complex.

Claim 21 (original): The expression cassette of claim 20, comprising a nucleic acid encoding a MTB39 antigen (SEQ ID NO:12 or 14) or an immunogenic fragment thereof from a *Mycobacterium* species of the tuberculosis complex, and a nucleic acid encoding a polypeptide comprising at least 195 amino acids from the N-terminus of a MTB32A antigen (SEQ ID NO: 2 or 4) from a *Mycobacterium* species of the tuberculosis complex.

Claim 22 (original): The expression cassette of claim 21, further comprising a nucleic acid encoding a polypeptide comprising at least 132 amino acids of the C-terminus of a MTB32A antigen (SEQ ID NO:2 or 4) from a *Mycobacterium* species of the tuberculosis complex.

Claim 23 (original): The expression cassette of claim 20, wherein the nucleic acid encodes a fusion polypeptide comprising a MTB39 antigen (SEQ ID NO:12 or 14) or an immunogenic fragment thereof and a nucleic acid encoding a MTB32A antigen (SEQ ID NO:2 or 4) or an immunogenic fragment thereof.

Claim 24 (original): The expression cassette of claim 23, wherein the nucleic acid encodes a fusion polypeptide comprising a MTB39 antigen (SEQ ID NO:12 or 14) or an immunogenic fragment thereof, and a polypeptide comprising at least 195 amino acids from the N-terminus of a MTB32A antigen (SEQ ID NO:2 or 4).

Claim 25 (original): The expression cassette of claim 24, wherein the fusion polypeptide further comprises a polypeptide comprising at least 132 amino acids of the C-terminus of a MTB32A antigen (SEQ ID NO:2 or 4).

Claim 26 (original): The expression cassette of claim 24, wherein the nucleic acid encodes a fusion polypeptide having the amino acid sequence of MTB59F (SEQ ID NO:20).

Claim 27 (original): The expression cassette of claim 26, wherein the nucleic acid has the sequence of the nucleic acid encoding MTB59F (SEQ ID NO:19).

Claim 28 (original): The expression cassette of claim 25, wherein the nucleic acid encodes a fusion polypeptide having the amino acid sequence of MTB72F (SEQ ID NO:16).

Claim 29 (original): The expression cassette of claim 28, wherein the nucleic acid has the sequence of the nucleic acid encoding MTB72F (SEQ ID NO:15).

Claim 30 (original): The expression cassette of claim 28, wherein the nucleic acid has the sequence of the nucleic acid encoding MTB72FMutSA (SEQ ID NO:18).

Claim 31 (currently amended): The expression cassette of claim 29 or 30, further comprising a nucleic acid encoding at least one additional antigen from a *Mycobacterium* species of the tuberculosis complex, wherein the antigen is selected from the group consisting of MTB8.4 antigen (SEQ ID NO:22), MTB9.8 antigen (SEQ ID NO:24), MTB9.9 antigen (SEQ ID NO:27), MTB40 antigen (SEQ ID NO:29), MTB41 antigen (SEQ ID NO:31), 38-kD (SEQ ID NO:35), TbRa3 (SEQ ID NO:37), 38 kD (SEQ ID NO:39), DPEP (SEQ ID NO:41), TbH4 (SEQ ID NO:43), DPPD (SEQ ID NO:45), MTB82, Erd14, ESAT-6 antigen (SEQ ID NO:33), MTB85 complex antigen, or  $\alpha$ -crystalline antigen, or an immunogenic fragment thereof.

Claim 32 (original): The expression cassette of claim 20, further comprising a nucleic acid encoding at least one additional antigen from a *Mycobacterium* species of the tuberculosis complex, wherein the antigen is selected from the group consisting of MTB8.4 antigen (SEQ ID NO:22), MTB9.8 antigen (SEQ ID NO:24), MTB9.9 antigen (SEQ ID NO:27), MTB40 antigen (SEQ ID NO:29), MTB41 antigen (SEQ ID NO:31), 38-kD (SEQ ID NO:35), TbRa3 (SEQ ID NO:37), 38 kD (SEQ ID NO:39), DPEP (SEQ ID NO:41), TbH4 (SEQ ID NO:43), DPPD (SEQ ID NO:45), MTB82, Erd14, ESAT-6 antigen (SEQ ID NO:33), MTB85 complex antigen, or  $\alpha$ -crystalline antigen, or an immunogenic fragment thereof.

Claim 33 (original): The expression cassette of claim 20, further comprising a nucleic acid encoding an NS1 antigen.

Claim 34 (original): The expression cassette of claim 20, wherein the *Mycobacterium* species is *Mycobacterium tuberculosis*.

Claim 35 (original): A method for eliciting an immune response in a mammal, the method comprising the step of administering to the mammal an immunologically effective amount of a pharmaceutical composition comprising a MTB39 antigen (SEQ ID NO:12 or 14) or an immunogenic fragment thereof from a *Mycobacterium* species of the tuberculosis complex, and a MTB32A antigen (SEQ ID NO:2 or 4) or an immunogenic fragment thereof from a *Mycobacterium* species of the tuberculosis complex.

Claim 36 (original): The method of claim 35, wherein the mammal has been immunized with BCG.

Claim 37 (original): The method of claim 35, wherein the mammal is a human.

Claim 38 (original): The method of claim 35, wherein the composition is administered prophylactically.

Claim 39 (original): The method of claim 35, comprising a MTB39 antigen (SEQ ID NO:12 or 14) or an immunogenic fragment thereof from a *Mycobacterium* species of the tuberculosis complex, and a polypeptide comprising at least 195 amino acids from the N-terminus of a MTB32A antigen (SEQ ID NO:2 or 4) from a *Mycobacterium* species of the tuberculosis complex.

Claim 40 (original): The method of claim 39, further comprising a polypeptide comprising at least about 132 amino acids from the C-terminus of MTB32A antigen (SEQ ID NO: 2 or 4) from a *Mycobacterium* species of the tuberculosis complex.

Claim 41 (original): The method of claim 35 or 39, wherein the antigens are covalently linked, thereby forming a fusion protein.

Claim 42 (original): The method of claim 41, wherein the fusion polypeptide has the amino acid sequence of MTB59F (SEQ ID NO:20).

Claim 43 (original): The method of claim 40, wherein the antigens are covalently linked, thereby forming a fusion protein.

Claim 44 (original): The method of claim 43, wherein the fusion polypeptide has the amino acid sequence of MTB72F (SEQ ID NO:16).

Claim 45 (original): The method of claim 43, wherein the fusion polypeptide has the amino acid sequence of MTB72FMutSA (SEQ ID NO:18).

Claim 46 (original): The method of claim 35, wherein the pharmaceutical composition further comprises an adjuvant.

Claim 47 (original): The method of claim 46, wherein the adjuvant comprises QS21 and MPL.

Claim 48 (original): The method of claim 46, wherein the adjuvant is selected from the group consisting of AS2, ENHANZYN, MPL, 3D-MPL, IFA, QS21, CWS, TDM, AGP, CPG, Leif, saponin, and saponin mimetics.

Claim 49 (original): A method for eliciting an immune response in a mammal, the method comprising the step of administering to the mammal an immunologically effective amount of an expression cassette comprising a nucleic acid encoding a MTB39 antigen (SEQ ID NO:12 or 14) or an immunogenic fragment thereof from a *Mycobacterium* species of the tuberculosis complex, and a nucleic acid encoding a MTB32A antigen (SEQ ID NO:2 or 4) or an immunogenic fragment thereof from a *Mycobacterium* species of the tuberculosis complex.

Claim 50 (original): The method of claim 49, wherein the mammal has been immunized with BCG.

Claim 51 (original): The method of claim 49, wherein the mammal is a human.

Claim 52 (original): The method of claim 49, wherein the composition is administered prophylactically.

Claim 53 (currently amended): The method of claim 49, wherein the nucleic acid encodes a fusion polypeptide comprising a MTB39 antigen (SEQ ID NO:12 or 14) or an immunogenic fragment thereof, and a polypeptide comprising at least 195 amino acids from the N-terminus of a MTB32A antigen (SEQ ID NO:2 or 4)[[ ]].

Claim 54 (original): The method of claim 53, further comprising a nucleic acid encoding a polypeptide comprising at least 132 amino acids of the C-terminus of a MTB32A antigen (SEQ ID NO:2 or 4) from a *Mycobacterium* species of the tuberculosis complex.

Claim 55 (currently amended): The method of claim 49, wherein the nucleic acid encodes a fusion polypeptide comprising a MTB39 antigen (~~SEQ ID NO: 12 or 14~~) (SEQ ID NO:12 or 14) or an immunogenic fragment thereof and a nucleic acid encoding a MTB32A antigen (SEQ ID NO:2 or 4) or an immunogenic fragment thereof.



Claim 56 (currently amended): The method of claim 55, wherein the nucleic acid encodes a fusion polypeptide comprising a MTB39 antigen (SEQ ID NO:12 or 14) or an immunogenic fragment thereof, and a polypeptide comprising at least 195 amino acids from the N-terminus of a MTB32A antigen (~~SEQ ID NO: 2 or 4~~) (SEQ ID NO:2 or 4).

Claim 57 (original): The method of claim 56, wherein the fusion polypeptide further comprises a polypeptide comprising at least 132 amino acids of the C-terminus of a MTB32A antigen (SEQ ID NO:2 or 4).

Claim 58 (original): The method of claim 56, wherein the nucleic acid encodes a fusion polypeptide having the amino acid sequence of MTB59F (SEQ ID NO:20).

Claim 59 (currently amended): The method of claim 58, wherein the nucleic acid has the nucleotide sequence of the nucleic acid encoding MTB59F (~~SEQ ID NO:19~~) (SEQ ID NO:19).

Claim 60 (currently amended): The method of claim 57, wherein the nucleic acid encodes a fusion polypeptide having the amino acid sequence of MTB72F (SEQ ID NO:16)[[ ]].

Claim 61 (original): The method of claim 57, wherein the nucleic acid encodes a fusion polypeptide having the amino acid sequence of MTB72FMutSA (SEQ ID NO:18).

Claim 62 (currently amended): The method of claim 60, wherein the nucleic acid has the nucleotide sequence of the nucleic acid encoding MTB72F (~~SEQ ID NO:15~~) (SEQ ID NO:15).

Claim 63 (original): The method of claim 60, wherein the nucleic acid has the nucleotide sequence of the nucleic acid encoding MTB72FMutSA (SEQ ID NO:17).

Claim 64 (original): An isolated nucleic acid encoding a MTB32A antigen from a *Mycobacterium* species of the tuberculosis complex, wherein at least one amino acid in the active site triad of the MTB32A antigen (SEQ ID NO:2 or 4) has been substituted by a different amino acid.

Claim 65 (currently amended): The nucleic acid of claim 64, wherein an serine residue corresponding to amino acid position 183 of SEQ ID NO:4 or position ~~207~~ 208 of SEQ ID NO:2 has been substituted by another amino acid.

Claim 66 (original): The nucleic acid of claim 65, wherein an alanine residue has been substituted for the serine residue.

Claim 67 (original): The nucleic acid of claim 66, wherein the nucleic acid comprises a nucleotide sequence of SEQ ID NO:5.

Claim 68 (original): A composition comprising the nucleic acid of claim 64.

Claim 69 (original): A nucleic acid encoding a fusion polypeptide comprising the nucleic acid of claim 64.

Claim 70 (original): An isolated MTB32A polypeptide from a *Mycobacterium* species of the tuberculosis complex, wherein at least one amino acid in the active site triad of the MTB32A antigen (SEQ ID NO:2 or 4) has been substituted by a different amino acid.

Claim 71 (currently amended): The polypeptide of claim 70, wherein a serine residue corresponding to amino acid position 183 of SEQ ID NO:4 or amino acid position ~~207~~ 208 of SEQ ID NO:2 has been substituted by another amino acid.

Claim 72 (original): The polypeptide of claim 71, wherein an alanine residue has been substituted for the serine residue.

Claim 73 (original): A polypeptide of claim 72, wherein the polypeptide comprises an amino acid sequence of SEQ ID NO:6.

Claim 74 (original): A composition comprising the polypeptide of claim 70.

Claim 75 (original): A fusion polypeptide comprising the polypeptide of claim 70.

Claim 76 (original): An isolated nucleic acid encoding a fusion polypeptide comprising a MTB39 antigen (SEQ ID NO:12 or 14) from a *Mycobacterium* species of the tuberculosis complex, and an antigen comprising at least 195 amino acids from the N-terminus of a MTB32A antigen (SEQ ID NO:2 or 4) from a *Mycobacterium* species of the tuberculosis complex, wherein an amino acid of the active site triad of the MTB32A antigen (SEQ ID NO:2 or 4) has been substituted by a different amino acid.

Claim 77 (currently amended): The nucleic acid of claim 76, wherein a serine residue corresponding to amino acid at position 183 of SEQ ID NO:4 or position ~~207~~ 208 or SEQ ID NO:2 has been substituted by another amino acid.

Claim 78 (original): The nucleic acid of claim 77, wherein an alanine residue has been substituted for the serine residue.

Claim 79 (original): A composition comprising the nucleic acid of claim 76.

Claim 80 (original): A nucleic acid encoding a fusion polypeptide comprising the nucleic acid of claim 76.

Claim 81 (original): A nucleic acid encoding a fusion polypeptide, wherein the nucleic acid comprises a nucleotide sequence of SEQ ID NO:17.

Claim 82 (original): A nucleic acid encoding a fusion polypeptide comprising an amino acid sequence of SEQ ID NO:18.

Claim 83 (currently amended): An isolated polypeptide encoding a fusion polypeptide comprising a MTB39 (~~SEQ ID NO: 12 or 14~~) (SEQ ID NO:12 or 14) antigen from a *Mycobacterium* species of the tuberculosis complex, and an antigen comprising at least 195 amino acids from the N-terminus of a MTB32A antigen (SEQ ID NO:2 or 4) from a *Mycobacterium* species of the tuberculosis complex, wherein an amino acid of the active site triad of the MTB32A antigen (SEQ ID NO:2 or 4) has been substituted by a different amino acid.

Claim 84 (currently amended): The polypeptide of claim 83, wherein an serine residue corresponding to amino acid position 183 of SEQ ID NO:4 or amino acid position ~~207~~ 208 of SEQ ID NO:2 has been substituted by another amino acid.

Claim 85 (original): The polypeptide of claim 83, wherein an alanine residue has been substituted for the serine residue.

Claim 86 (original): A composition comprising the polypeptide of claim 83.

Claim 87 (original): A fusion polypeptide comprising the polypeptide of claim 83.

Claim 88 (original): A fusion polypeptide comprising an amino acid sequence of SEQ ID NO:18.